NEW SPECIES NAMES IN TIPULIDAE (DIPTERA).

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Abstract

Five new names for species of Tipulidae, one in *Tipula*, one in *Nephrotoma*, and three in *Limonia*, are proposed to replace preoccupied names.

In preparing the Tipulidae part for the Catalogue of the Australian/Oceanian Diptera, to be published by the Bernice P. Bishop Museum, Honolulu, a number of species names turned out to be preoccupied. The new names proposed for these species are as follows:

Tipula vanewrighti **nom. nov.** for *Tipula lateralis* Walker, 1848: 70, preoccupied by Meigen, 1818: 174.

Named after Richard I. Vane-Wright in honour of his work on *Holorusia* and related genera (Vane-Wright, 1967). This north-west Australian species was assigned to *Holorusia* by Vane-Wright, but was provisionally placed in *Tipula (Acutipula)* by Dobrotworsky, 1974.

Nephrotoma walkeri **nom. nov.** for *Pachyrrhina tenuis* Walker, 1865: 106, preoccupied by Loew, 1863: 297.

The highest number of insect species, described by one man, Francis Walker, is about 20,000. Large numbers of insect species were described as well by Maurice Pic (*c.* 15,000), Edward Meyrick (*c.* 15,000), Charles P. Alexander (*c.* 11,000), Edmund Reiter (*c.* 10,000), Johann C. Fabricius (9-10,000) and Thomas L. Casey (9-10,000).

Limonia (Dicranomyia) pictithorax ssp. *veenmani* **nom. nov.** for *Dicranomyia pictithorax* ssp. *argentifera* Alexander, 1924: 565, preoccupied by de Meijere, 1911: 29.

Named after the Veenman word processor on which the Tipulidae part for the above mentioned catalogue was written.

Limonia (Discobola) milleri **nom. nov.** for *Tipula fumipennis* Hudson, 1892: 48, preoccupied by Butler, 1875: 355.

Named after David Miller for his work on New Zealand entomology.

Limonia (Libnotes) subfasciatula **nom. nov.** for *Libnotes subfasciata* Edwards, 1926: 137, preoccupied by Alexander, 1924: 563.

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BOOK REVIEW

Biological Control in Agricultural IPM Systems edited by Marjorie A. Hoy and Donald C. Herzog. Pub. August, 1985. 589 pages, case bound. Academic Press, Florida and London. Price US$49.50.

Ever since the spectacular early successes of classical biological control of insect pests and weeds the approach of augmenting or conserving natural enemies in agricultural systems has been enthusiastically researched as a component of integrated pest management (IPM) systems.

This book arose out of a symposium of the same name held at the Citrus Research and Education Centre, University of Florida, June 4-6, 1984. Its aim was not simply to discuss aspects of biological control but in the words of the editors to "scrutinise very carefully the current status of biological control in our agricultural IPM systems . . .". The book is thus not simply a compendium of biological control research but attempts to determine why, despite being viewed as a cornerstone of IPM, research on biological control has so rarely been implemented.

In its 31 chapters the book provides an extensive overview of the current state of biological control of arthropods, weeds, nematodes and plant pathogens in IPM systems and of research techniques applicable to many aspects of the field. After a general introduction (4 chapters) covering historical aspects of biological control, the current status of IPM in agriculture and cost-benefit analyses, there are sections on biological control of arthropods (14 chapters), weeds (2 chapters), plant pathogens (4 chapters) and nematodes (1 chapter). Finally the current status and limits to biological control are examined in five representative cropping systems; citrus, vineyards, alfalfa, cotton and soybean. Despite this multitude of chapters and authors, the editors have done an excellent job in limiting overlap in subject matter. Topics covered include: the interaction of biological control with resistant crop varieties and selective pesticides; improved establishment, recognition of biotypes and genetic improvement of natural enemies; estimating the abundance and impact of natural enemies and their incorporation into crop/pest models. In addition some chapters provide critical analyses of current systems based on augmentation of predators and parasites and cost-benefit analyses of IPM and biological control programs in general. As well as providing comprehensive reviews of particular areas each chapter lists specific recommendations for future research, development and implementation of biological control systems.

Although the chapters are too numerous to summarise individually some highlights are an historical account by Huffaker in which he laments that "far more has been said about the *possibilities* than about proven, large-scale *commercial utilization*" of biological control systems. Herzog and Funderbunk provide an interesting discussion of interaction between biological control and other elements of IPM systems such as resistant plant cultivars and cultural practices. They point out that augmentation of natural enemies may not always be compatible with strategies which alter the physical or